

## Susan A. Odom

Curriculum Vitae

Assistant Professor  
University of Kentucky  
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### POSITIONS

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Assistant Professor of Chemistry, University of Kentucky	2011-present
Visiting Scientist, Argonne National Laboratory	2009 – 2011
Postdoctoral Fellow, University of Illinois at Urbana-Champaign	2008-2011
Graduate Student, Georgia Institute of Technology	2003-2008
Visiting Graduate Student, University of Oxford	2005
Undergraduate Research Assistant, University of Kentucky	2001-2003
Undergraduate Research Assistant, Cornell University	2001

### EDUCATION

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<b>Georgia Institute of Technology</b> , Atlanta, GA <i>Ph.D. Chemistry</i> , 2008, Advisor: Seth R. Marder	2003-2008
<b>University of Kentucky</b> , Lexington, KY <i>B.S. Chemistry</i> , 2003, Advisor: John E. Anthony	1999-2003

### RESEARCH INTERESTS

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Electronic structure of organic molecules, electron transfer, stability and reactivity of conjugated radical cations and dications, lithium-ion batteries, non-aqueous redox-flow batteries.

### HONORS AND AWARDS

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Electrochemical Society Travel Award	2016
Diversity in Research Award, College of Arts & Sciences, University of Kentucky	2014
Emerging Investigator, <i>Chemical Communications</i>	2014
Teacher Who Made a Difference, University of Kentucky	2012, 2013, 2016
ACS PRF - Doctoral New Investigator	2011
NSF ACC Postdoctoral Fellowship	2009
Best Poster Award, Materials Research Symposium	2009
Graduate Research Fellowship, National Science Foundation	2005

### PUBLICATIONS

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#### INDEPENDENT CAREER

40) "Synthesis and Photophysics of Ethynylated Acenes for an Organic Chemistry Laboratory Course." Petty, A.J. II; Odom, S.A.\* manuscript submitted to *Journal of Chemical Education* on October 4, 2016, manuscript ID ed-2016-00741m

- 39) **“Preventing Planarization of Phenothiazine Radical Cations as a Method for Raising Oxidation Potentials.”** Casselman, M.D.; Elliott, C.F.; Modekrutti, S.; Zhang, P.L.; Parkin, S.R.; Risko, C.R.;\* Odom, S.A.\* manuscript submitted to *Angewandte Chemie International Edition* on June 16, 2016, manuscript ID 201605854
- 38) **“High-Current-Density, Long-Duration Cycling of Soluble Organic Active Species for Non-Aqueous Redox Flow Batteries.”** Milshtein, J.D.; Kaur, A.P.; Casselman, M.D.; Kowalski, J.A.; Modekrutti, S.; Zhang, P.; Attanayake, N.H.; Elliott, C.F.; Parkin, S.R.; Risko, C.; Brushett, F.R.;\* Odom, S.A.\* *Energy and Environmental Science*, ASAP articles, DOI: 10.1039/C6EE02027E
- 37) **“Molten Zinc Alloys for Lower Temperature, Lower Cost Liquid Metal Batteries.”** Holubowitch, N.E.; Manek, S.E.; Landon, J.; Lippert, C.A.; Odom, S.A.; Liu, K.,\* *Advanced Materials Technologies*, **2016**, *1*. DOI: 10.1002/admt.201600035
- 36) **“Overcharge Protection at Above 4 V with Phenothiazine Derivatives.”** Kaur, A.P.; Casselman, M.D.; Elliott, C.F.; Risko, C.; Odom, S.A.,\* *Journal of Materials Chemistry A*, **2016**, *4*, 5410-5414. DOI: 10.1039/C5TA10375D
- 35) **“Carbonic Anhydrase Mimics for Enhanced CO<sub>2</sub> Absorption in an Amine-Based Capture Solvent.”** Lippert, C.A.,\* Burrows, R.A.; Miller, D.A.; Parkin, S.R.; Liu, K.; Remias, J.E.; Yang, Y.; Lightstone, F.C.; Liu, K.; Odom, S.A.,\* *Dalton Transactions*, **2016**, *45*, 324-333. DOI: 10.1039/C5DT02943K
- 34) **“Cathode Candidates for a New Zinc-Based Energy Storage Technology.”** Holubowitch, N.E.; Manek, S.E.; Landon, J.; Lippert, C.A.; Odom, S.A.; Liu, K.,\* *International Journal of Energy Research*, **2016**, *40*, 393-399. DOI: 10.1002/er.3385
- 33) **“Overcharge Performance of 3,7-Bis(trifluoromethyl)-N-ethylphenothiazine at High Concentrations in Lithium-Ion Batteries.”** Kaur, A.P.; Elliott, C.F.; Ergun, S.; Odom, S.A.,\* *Journal of the Electrochemical Society*, **2016**, *163*, A1-A7. DOI: 10.1149/2.0951514jes
- 32) **“A Highly Soluble Organic Catholyte for Non-Aqueous Redox Flow Batteries.”** Kaur, A.P.; Holubowitch, N.E.; Ergun, S.; Elliott, C.F.; Odom, S.A.\* *Energy Technology*, **2015**, *3*, 476–480. (cover article, named a top 10 article of 2015) DOI: 10.1002/ente.201500020
- 31) **“The Fate of Phenothiazine-Based Redox Shuttles in Lithium-Ion Batteries.”** Casselman, M.D.; Kaur, A.P.; Narayana, K.A.; Elliott, C.F.; Risko, C.;\* Odom, S.A.\* *Physical Chemistry Chemical Physics*, **2015**, *17*, 6905-6912. DOI: 10.1039/C5CP00199D
- 30) **“N-Substituted Phenothiazine Derivatives: How Stability of the Neutral and Radical Cation Forms Affects Overcharge Performance in Lithium-Ion Batteries.”** Narayana, K.A.; Casselman, M.D.; Elliott, C.F.; Ergun, S.; Risko, C.;\* Odom, S.A.\* *ChemPhysChem*, **2015**, *16*, 1179–1189. (cover article) DOI: 10.1002/cphc.201402674
- 29) **“3,7-Bis(trifluoromethyl)-N-Ethylphenothiazine: A Redox Shuttle with Extended Overcharge Protection.”** Kaur, A.P.; Ergun, S.; Elliott, C.F.; Odom, S.A.\* *Journal of Materials Chemistry A*, **2014**, *2*, 18190–18193. DOI: 10.1039/C4TA04463K
- 28) **“Improving Carbon Capture from Power Plant Emissions with Zinc- and Cobalt-based Catalysts.”** Lippert, C.A.; Liu, K.; Sharma, M.; Parkin, S.R.; Remias, J.E.; Brandewie, C. M.; Odom, S.A.,\* Liu, K.\* *Catalysis Science & Technology*, **2014**, *4*, 3620–3625. DOI: 10.1039/C4CY00766B
- 27) **“Controlling Oxidation Potentials in Redox Shuttle Candidates for Lithium-Ion Batteries.”** Ergun, S.; Elliott, C.F.; Kaur, A.P.; Parkin, S.R.; Odom, S.A.\* *Journal of Physical Chemistry C*, **2014**, *118*, 14824–14832. DOI: 10.1021/jp503767h

26) **“Overcharge Performance of 3,7-Disubstituted *N*-Ethylphenothiazine Derivatives in Lithium-Ion Batteries.”** Ergun, S.; Elliott, C.F.; Kaur, A.P.; Parkin, S.R.; Odom, S.A.\* *Chemical Communications*, **2014**, *50*, 5339–5341. (invited for 2014 Emerging Investigators Issue) DOI: 10.1039/C3CC47503D

25) **“A Fast, Inexpensive Method for Predicting Overcharge Performance in Lithium-Ion Batteries,”** Odom, S.A.\*; Ergun, S.; Poudel, P.P.; Parkin, S.R. *Energy and Environmental Sciences*, **2014**, *7*, 760–767. DOI: 10.1039/C3EE42305K

#### UNDERGRADUATE, GRADUATE, AND POSTDOCTORAL WORK

24) **“3-Hexylthiophene as a Stabilizing Additive for High Voltage Cathodes for Lithium-Ion Batteries.”** Abouimrane, A.; Odom, S.A.; Tavassol, H.; Schulmerich, M.C.; Bhargava, R.; Gewirth, A.A.; Moore, J.S.\*; Amine, K.\* *Journal of the Electrochemical Society*, **2013**, *160*, A268–A277. DOI: 10.1149/s.039302jes

23) **“Autonomic Restoration of Electrical Conductivity using Polymer-Stabilized Carbon Nanotube and Graphene Microcapsules.”** Odom, S.A.; Tyler, T.P.; Caruso, M.M.; Ritchey, J.; Schulmerich, M.V.; Robinson, S.J.; Bhargava, R.; Sottos, N.R.; White, S.R.; Hersam, M.C.\*; Moore, J.S.\* *Applied Physics Letters*, **2012**, *101*, 043106-1–043106-5. DOI: 10.1063/1.4737935

22) **“Tuning Delocalization in the Radical Cations of 1,4-Bis[4-(diaryl amino)styryl]benzenes, 2,5-Bis[4-(diaryl amino)styryl]thiophenes, and 2,5-Bis[4-(diaryl amino)styryl]pyrroles through Substituent Effects.”** Barlow, S.\*; Risko, C.; Odom, S.A.; Zheng, S.; Beverina, L.; Brédas, J.-L.; Marder, S.R. *Journal of the American Chemical Society*, **2012**, *134*, 10146–10155. DOI: 10.1021/ja3023048

21) **“A Self-Healing Conductive Ink.”** Odom, S.A.; Chayanupatkul, S.; Blaiszik, B.J.; Zhao, O.; Jackson, A.C.; Braun, P.V.; Sottos, N.R.; White, S.R.\*; Moore, J.S.\* *Advanced Materials*, **2012**, *24*, 2578–2581. (cover article) DOI: 10.1002/adma.201200196

20) **“Visual Indication of Mechanical Damage Using Core-Shell Microcapsules.”** Odom, S.A.; Jackson, A.C.; Prokup, A.M.; Chayanupatkul, S.; Sottos, N.R.; White, S.R.; Moore, J.S.\* *ACS Applied Materials and Interfaces*, **2011**, *3*, 4547–4551. DOI: 10.1021/am201048a

19) **“Triggered Release from Polymer Capsules.”** Esser-Kahn, A.P.; Odom, S.A.; Sottos, N.R.; White, S.R.; Moore, J.S.\* *Macromolecules*, **2011**, *44*, 5539–5553. (cover article)

18) **“Restoration of Conductivity with TTF-TCNQ Charge-Transfer Salts.”** Odom, S.A.; Caruso, M.M.; Finke, A.D.; Prokup, A.R.; Ritchey, J.A.; Leonard, J.R.; White, S.R.; Sottos, N. R.; Moore, J. S.\* *Advanced Functional Materials*, **2010**, *20*, 1721–1727. (cover article)

17) **“Electronic and Optical Properties of 4*H*-Cyclopenta[2,1-*b*:3,4-*b'*]bithiophene Derivatives and Their 4-Heteroatom-Substituted Analogues: A Joint Theoretical and Experimental Comparison.”** Barlow, S.; Odom, S.A.; Lancaster, K.; Getmanenko, Y.A.; Mason, R.J.; Coropceanu, V.; Brédas, J.-L.; Marder, S.R.\* *Journal of Physical Chemistry B* **2010**, *114*, 14397–14407.

16) **“Masked Cyanoacrylates Unveiled by Mechanical Force.”** Kryger, M.J.; Ong, M.T.; Odom, S.A.; Sottos, N.R.; White, S.R.; Martinez, T.J.; Moore, J.S.\* *Journal of the American Chemical Society*, **2010**, *132*, 4558–4559.

15) **“Electronic Properties of the 2,6-Diiododithieno[3,2-*b*:2',3'-*d'*]thiophene Molecule and Crystal: A Joint Experimental and Theoretical Study.”** Sanchez-Carrera, R.S.; Odom, S.A.; Kinnibrugh, T.L.; Sajoto, T.; Kim, E.-G.; Timofeeva, T.V.; Barlow, S.; Coropceanu, V.; Marder, S.R.; Brédas, J.-L.\* *Journal of Physical Chemistry B*, **2010**, *114*, 749–755.

- 14) **“Linear and Nonlinear Spectroscopy of a Porphyrin-Squaraine-Porphyrin Conjugated System.”** Webster, S.; Odom, S.A.; Padilha, L.; Przhonska, O.V.; Peceli, D.; Hu, H.; Nootz, G.; Kachkovski, A.D.; Matichak, J.; Barlow, S.; Anderson, H.L.; Marder, S.R.; Hagan, D.J.; Van Stryland, E.W.\* *Journal of Physical Chemistry A*, **2009**, *113*, 14854–14867.
- 13) **“Mechanically-Induced Chemical Changes in Polymeric Materials.”** Caruso, M.M.; Davis, D.A.; Shen, Q.; Odom, S.A.; Sottos, N.R.; White, S.R.; Moore, J.S.\* *Chemical Reviews*, **2009**, *109*, 5755–5798.
- 12) **“Photophysical Properties of an Alkyne-Bridged Bis(Zinc Porphyrin)-Perylene Diimide Derivative.”** Odom, S.A.; Kelley, R.F.; Ohira, S.; Ensley, T.; Huang, C.; Padilha, L.A.; Webster, S.; Coropceanu, V.; Barlow, S.; Hagan, D.; Van Stryland, E.W.; Brédas, J.-L.; Anderson, H.L.; Wasielewski, M.R.; Marder, S.R.\* *Journal of Physical Chemistry A*, **2009**, *113*, 10826–10832.
- 11) **“Synthesis and Two-Photon Spectrum of a Bis(Porphyrin)-Substituted Squaraine.”** Odom, S.A.; Webster, S.; Padilha, L.A.; Peceli, D.; Hu, H.; Nootz, G.; Chung, S.-J.; Ohira, S.; Matichak, J.D.; Przhonska, O.V.; Kachkovski, A.D.; Barlow, S.; Brédas, J.-L.; Anderson, H.L.; Hagan, D.J.; Van Stryland, E.W.; Marder, S.R.\* *Journal of the American Chemical Society*, **2009**, *131*, 7510–7511.
- 10) **“Synthesis and Photophysical Properties of Donor- and Acceptor-Substituted 1,7-Di(arylkynyl)perylene-3,4:9,10-bis(dicarboximide)s.”** An, Z.; Odom, S.A.; Kelley, R.F.; Huang, C.; Barlow, S.; Zhang, X.; Padilha, L.; Fu, J.; Webster, S.; Hagan, D.; Van Stryland, E.W.; Marder, S.R.\* *Journal of Physical Chemistry A*, **2009**, *113*, 5585–5593.
- 9) **“A Spray-Processable, Low Bandgap, and Ambipolar Donor-Acceptor Conjugated Polymer.”** Steckler, T.T.; Zhang, X.; Hwang, J.; Honeyager, R.; Ohira, S.; Zhang, X.-H.; Grant, A.; Ellinger, S.; Odom, S.A.; Sweat, D.; Tanner, D.B.; Rinzler, A. G.; Barlow, S.; Brédas, J.-L.; Kippelen, B.; Marder, S.R.\*; Reynolds, J.R.\* *Journal of the American Chemical Society*, **2009**, *131*, 2824–2826.
- 8) **“Intramolecular Electron-Transfer Rates in Mixed-Valence Triarylamines: Measurement by Variable-Temperature ESR Spectroscopy and Comparison with Optical Data.”** Lancaster, K.; Odom, S.A.; Jones, S.; Thayumanavan, S.; Marder, S.R.; Brédas, J.-L.; Coropceanu, V.\*; Barlow, S.\* *Journal of the American Chemical Society*, **2009**, *131*, 1717–1723.
- 7) **“Thick Optical-quality Films of Substituted Polyacetylenes with Large, Ultrafast Third-order Nonlinearities and Application to Image Correlation.”** Chi, S.-H.; Hales, J.M.; Fuentes-Hernandez, C.; Tseng, S.-Y.; Cho, J.-Y.; Odom, S.A.; Zhang, Q.; Barlow, S.; Schrock, R.; Marder, S.R.; Kippelen, B.; Perry, J.W.\* *Advanced Materials*, **2008**, *20*, 3188–3210.
- 6) **“Stabilization of a Heptamethine Cyanine Dye by Rotaxane Encapsulation.”** Yau, C. M. S.; Pascu, S.; Odom, S.A.; Warren, J.E.; Klotz, E.J.; Frampton, M.J.; Williams, C.C.; Coropceanu, V.; Kuimova, M.K.; Phillips, D.; Barlow, S.; Brédas, J.-L.; Marder, S.R.; Millar, V.; Anderson, H.L.\* *Chemical Communications*, **2008**, *25*, 2897–2899.
- 5) **“Bis(di-4-alkoxyphenyl)amino Derivatives of Dithienylethene, Bithiophene, Dithienothiophene, and Dithienopyrrole: Palladium-catalysed Synthesis and Highly Delocalised Racial Cations.”** Odom, S.A.; Lancaster, K.; Beverina, L.; Lefler, K.M.; Thompson, N.J.; Coropceanu, V.; Brédas, J.-L.; Marder, S.R.; Barlow, S.\* *Chemistry: A European Journal*, **2007**, *13*, 9637–9646.
- 4) **“Aromatic Amines: A Comparison of Electron-Donor Strengths.”** Kwon, O.; Barlow, S.; Odom, S.A.; Beverina, L.; Thompson, N.J.; Zojer, E.; Brédas, J.-L.; Marder, S.R.\* *Journal of Physical Chemistry A*, **2005**, *109*, 9346–9352.
- 3) **“Persistent Photoexcited Conducting States in Functionalized Pentacene.”** Brooks, J. S.\*; Tokumoto, T.; Choi, E.; Graf, D.; Biskup, N.; Eaton, D.; Anthony, J.E.; Odom, S.A. *Journal of Applied Physics*, **2004**, *96*, 3312–3318.

2) **“Stable, Crystalline Acenedithiophenes with up to Seven Linearly Fused Rings.”** Payne, M.M.; Odom, S.A.; Parkin, S.R.; Anthony, J.E.\* *Organic Letters*, **2004**, *6*, 3325–3328. DOI: 10.1021/ol048686d

1) **“Tetracene Derivatives as Potential Red Emitters for Organic LEDs.”** Odom, S.A.; Parkin, S.R.; Anthony, J.E.\* *Organic Letters*, **2003**, *5*, 4245–4248.

## PATENTS AND PATENT APPLICATIONS

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### PROVISIONAL PATENT APPLICATIONS

7) **“Two-electron-donating Phenothiazines and Use Thereof.”** Odom, S.A.; Kaur, A.P.; Casselman, M.D., provisional patent application, Serial No. 62,378,443, filed August 23, 2016.

6) **“Polyborosiloxane Binders.”** Shariaty, D.A.; Cheng, Y.T.; Odom, S.A., provisional patent application, Serial No. 62/363,646, filed on July 18, 2016.

5) **“1,9,10-Substituted Phenothiazine Derivatives with Strained Radical Cations and Use Thereof.”** Odom, S.A.; Risko, C.; Casselman, M.D.; Elliott, C.F.; Modekrutti, S., provisional patent application, Serial No. 62/364,060, filed on July 18, 2016.

4) **“Perfluorinated Phenothiazines.”** Odom, S.A.; Kaur, A.P., Elliott, C.F., provisional patent application, Serial No. 62/356,388, filed on June 29, 2016.

3) **“Low Temperature Liquid Metal Batteries for Energy Storage Applications.”** Lippert, C. A.; Liu, K.; Landon, J.; Odom, S.A.; Holubowitch, N.E., provisional patent application, Serial No. 62/278,134, filed on January 13, 2016.

2) **“Highly Soluble, Liquid Phenothiazines.”** Odom, S.A.; Casselman, M.D., provisional patent application, Serial No. 62/261,370, filed on December 1, 2015.

1) **“Solvent-Free Dry Powder-Coating Method for Electrode Fabrication.”** Cheng, Y.T.; Odom, S.A.; Saito, K.; Al-Shroofy, M.; Zhang, Q.; Xu, J., provisional patent application, Serial No. 62/236,171, filed on October 2, 2015.

### NON-PROVISIONAL PATENT APPLICATIONS

2) **“Non-aqueous Redox Flow Batteries Containing 3,7-Perfluoroalkylated Phenothiazine Derivatives.”** Odom, S.A.; Kaur, A.P.; Elliott, C.F.; Casselman, M.D., U.S. Pat. Appl. 20150372333, Serial number 14/747,816, filed on June 23, 2015.

1) **“Materials and Methods for Autonomous Battery Shutdown.”** Moore, J.S.; Sottos, N.R.; White, S.R.; Amine, K.; Thackeray, M.; Blaiszik, B.J.; Esser-Kahn, A.P.; Odom, S.A.; Weng, W.; Zhang, Z.; Baginska, M.B., U.S. Pat. Appl. 20130171484, Serial No. 13/489,871, filed on July 4, 2013.

### AWARDED PATENTS

5) **“Catalysts to and Methods of Increasing the Overall Mass Transfer Rate of Acid Gas Scrubbing Solvents.”** Remias, J.E.; Lippert, C.A.; Liu, K.; Odom, S.A.; Burrows, R.A., U.S. Patent 9,266,102,

granted February 23, 2016.

4) **“Electrode Stabilizing Materials.”** Amine, K.; Abouimrane, A.; Moore, J.S.; Odom, S.A., U.S. Patent 9,178,249, granted November 3, 2015.

3) **“System for Visual Indication of Mechanical Damage.”** Odom, S.A.; Caruso, M.M.; Finke, A.D.; Jackson, A.C.; Moore, J.S.; Sottos, N.R.; White, S.R., U.S. Patent 8,846,404, granted September 30, 2014.

2) **“Materials and Methods for Autonomous Restoration of Electrical Conductivity.”** Blaiszik, B.J.; Odom, S.A.; Caruso, M.M.; Jackson, A.C.; Baginska, M.B.; Ritchey, J.A.; Finke, A.D.; White, S.R.; Moore, J.S.; Sottos, N.R.; P. Braun, K. Amine, U.S. Patent 8,679,621, granted March 25, 2014.

1) **“Silylethynylated Heteroacenes and Electronic Devices Made Therewith.”** Anthony, J.E.; Payne, M.M.; Odom, S.A.; Parkin, S.R., U.S. Patent 7,385,211, granted June 10, 2008.

## CONFERENCE PROCEEDINGS

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### INDEPENDENT CAREER

16) **“On the Stability and Reactivity of Redox Shuttles in Their Neutral and Radical Cation Forms.”** Odom, S.A.; Casselman, M.D.; Kaur, A.P.; Ergun, S.; Zhang, N. *Proceedings of the Materials Research Symposium, 2015, 1740*, DOI: 10.1557/opl.2015.458

15) **“A Highly Soluble Redox Shuttle with Superior Rate Performance in Overcharge Protection.”** Odom, S.A.; Kaur, A.; Ergun, S.; Elliott, C.F.; Casselman, M.D. *Proceedings of the Materials Research Symposium, 2015, 1740*, DOI: 10.1557/opl.2015.204

14) **“Zn-Sn Electrochemical Cells with Molten Salt Eutectic Electrolytes and Their Potential for Energy Storage Applications.”** Holubowitch, N.; Manek, S.; Landon, J.; Lippert, C.; Odom, S.A.; Liu, K.\* *ECS Transactions, 2014*.

13) **“A Fast Method for Screening Redox Shuttle Additives for Lithium-Ion Batteries.”** Poudel, P.P.; Ergun, S.; Ng, N.; Parkin, S.R.; Odom, S.A.\* *Preprints – American Chemical Society, Division of Energy & Fuels, 2013, 58, 108–109*.

12) **“Phenothiazine-based Redox Shuttles for Overcharge Protection in Lithium-Ion Batteries.”** Odom, S.A.\*; Ergun, S.; Elliott, C.F.; Poudel, P.P. *Preprints – American Chemical Society, Division of Energy & Fuels, 2013, 58, 105–106*.

11) **“Increasing Redox Shuttle Oxidation Potentials to Match High Voltage Cathodes in Lithium-Ion Batteries.”** Odom, S.A.\*; Ergun, S.; Elliott, C.F.; Gandy, C.L.; Walsh, E.J. *Preprints – American Chemical Society, Division of Energy & Fuels, 2013, 58, 525–526*.

### UNDERGRADUATE, GRADUATE, AND POSTDOCTORAL WORK

10) **“Thermoresponsive Microcapsules for Autonomic Lithium-Ion Battery Shutdown.”** Baginska, M.; Blaiszik, B.J.; Odom, S.A.; Esser-Kahn, A. E.; Caruso, M.M.; Moore, J.S.; Sottos, N.R.; White, S.R.\* *Proceedings of the Society of Experimental Mechanics Series, 2011, 16, 17–23*.

9) **“New Microcapsule Cores for Self-Healing Plastics and Electronics.”** Odom, S.A.; Tyler, T.P.; Caruso, M.M.; Schulmerich, M.V.; Ingoglia, B.T.; Ergun, S.; Bhargava, R.; Sottos, N.R.; White, S.R.;

Hersam, M.C.; Moore, J.S.\* *PMSE Preprints*, 2012.

8) **“Characterization of Nonlinear Molecular Dynamics Using the Double Pump Probe Technique.”** Peceli, D.; Cirloganu, C.; Webster, S.; Padilha, L.A.; Hagan, D.J.; Van Stryland, E.W.; Odom, S.A.; Matichak, J.; Barlow, S.; Dasari, R.R.; Marder, S.R. *Frontiers in Optics*, OSA Technical Digest, Optical Society of America, 2008.

7) **“Temporal and Spectral Nonlinear Absorption Characterization of a Hybrid Porphyrin-Squaraine-Porphyrin Macromolecule.”** Webster, S.; Odom, S. A.; Peceli, D.; Padilha, L. A.; Przhonska, O. V.; Hu, H.; Nootz, G.; Kachkovski, A. D.; Barlow, S.; Anderson, H. L.; Marder, S. R.; Hagan, D. J. Van Stryland, E. W. *Laser Science*, 2008.

6) **“Organic Materials for All-optical Signal Processing and Optical Limiting.”** Perry, J.W.; Hales, J.M.; Chi, S.-H.; Cho, J.-Y.; Odom, S.A.; Zhang, Q.; Zheng, S.; Schrock, R.R.; Screen, T.E.O. *Polymer Preprints*, 2008, 49, 989–990.

5) **“Processible Polyacetylene-Based  $\chi^{(3)}$  Materials for Photonic Applications.”** Chi, S.-H.; Hales, J. H.; Cho, J.-Y.; Odom, S. A.; Zhang, Q.; Schrock, R. R.; Marder, S. R.; Perry, J. W. *Lasers and Electrooptics*, 2007.

4) **“Organic Materials for Photovoltaic Applications.”** Marder, S.R.; An, Z.; Zhan, X.; Odom, S.A.; Huang, C.; Barlow, S.; Jones, S.; Kippelen, B.; Yoo, S.; Domercq, B.; Postcavage, W.; Wasielewski, M.; McCamant, D.; Lockhard, J.; Cohen, B.; Kelly, R.; Anderson, H. *PMSE Preprints* 2006, 95, 99.

3) **“Toward the Realization of Practicable Materials for  $\chi^{(3)}$  Based Photonic Applications.”** Hales, J. M.; Chi, S.-H.; Cho, J.-Y.; Odom, S.A.; Zhang, Q.; Schrock, R.R.; Screen, T. E. O.; Anderson, H. L.; Marder, S.R.; Perry, J.W. *Lasers and Electrooptics*, 2006.

2) **“Persistent Photoexcited Conducting States in Functionalized Pentacene.”** Tokumoto, T.; Brooks, J.; Graf, D.; Choi, E.; Biskup, N.; Eaton, D.; Anthony, J.E.; Odom, S.A. *Synthetic Metals*, 2005, 152, 449–452.

1) **“Transport and Melt Processing in Functionalized Pentacene with “Organic Wire” Connections.”** Brooks, J. S.; Vasic, R.; Tokumoto, T.; Graf, D.; Chung, O.H.; Anthony, J.E.; Odom, S.A. *Current Applied Physics*, 2004, 4, 479–493.

## INVITED PRESENTATIONS

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30. “Restructuring CHE 533 to Mimic a Research Environment.” STEM Teaching Enhancement and Scholarly Forum, University of Kentucky, April 29, 2016.
29. “Electron-Donating Phenothiazines for Energy Storage Applications.” Spring 2016 Materials Research Symposium, Phoenix, AZ, March 30, 2016.
28. “Electro-Active Organic Materials for Use in Electrochemical Energy Storage Systems.” University of Washington, Molecular Engineering Seminar Series, March 15, 2016.
27. “Using Organic Compounds to Improve the Lifetimes and Safety of Electrochemical Energy Storage Devices.” Eastern Kentucky University, Department of Chemistry, February 5, 2016.
26. “Electron-Donating Phenothiazines for Energy Storage Applications.” Argonne National Laboratory, January 26, 2016.
25. “Extending Battery Lifetimes with Electrolyte Additives.” Southern Illinois University, Department of Chemistry, January 30, 2015.
24. “On the Stability and Reactivity of Redox Shuttles in Their Neutral and Radical Cation Forms.” Kentucky Electrochemical Society and University of Kentucky Materials Research Society Student Chapters, Lexington, KY, November 19, 2014.

23. "On the Stability, Reactivity, and Performance of Electrolyte Additives for Overcharge Protection in Lithium-Ion Batteries." Oak Ridge National Laboratory, July 7, 2014.
22. "Electrolyte Additives for Overcharge Protection in Lithium-Ion Batteries." Kentucky Organic Electronic Materials Symposium, Lexington, KY, June 22, 2014.
21. "Stability and Reactivity of Aromatic Electrolyte Additives for Lithium-Ion Batteries." George Washington University, Department of Chemistry, April 25, 2014.
20. "Aromatic Redox Shuttles for Overcharge Protection in Lithium-Ion Batteries." Michigan State University, Department of Chemistry, October 30, 2013.
19. "Phenothiazine-Based Redox Shuttles for Overcharge Protection in Lithium-Ion Batteries." University of Texas at Dallas, October 11, 2013.
18. "Synthesis and Analysis of Redox Shuttles for Overcharge Protection in Lithium-Ion Batteries." 246<sup>th</sup> National Meeting of the American Chemical Society (A Tribute to Professor Jeffrey S. Moore, PMSE Division), Indianapolis, IN, September 2013.
17. "Increasing Redox Shuttle Oxidation Potentials to Match High Voltage Cathodes in Lithium-Ion Batteries." 245<sup>th</sup> National Meeting of the American Chemical Society (ENFL), New Orleans, LA, April, 9, 2013.
16. "New Methods for Evaluating Redox Shuttle Electrolyte Additives for Lithium-Ion Batteries." Murray State University, Department of Chemistry, February 25, 2013.
15. "New Applications of Polymer-based Core-shell Capsules." University of Kentucky, Department of Chemical and Materials Engineering, September 19, 2012.
14. "New Microcapsule Cores for Self-Healing Plastics and Electronics." PMSE Young Investigator Symposium, ACS National Meeting, Philadelphia, PA, August 2012.
13. "Increasing Longevity in Plastics and Electronics." MRSEC Young Investigator Seminar Series, University of Massachusetts, Amherst, MA, March 15, 2012.
12. "Extending Lifetimes of Electronic Materials." University of Louisville, Conn Energy Center, February 24, 2012.
11. "Responsive Microcapsules for Self-Healing Applications." Beckman Institute Forum for Imaging and Visualization, University of Illinois, Urbana, IL, April 26, 2011.
10. "Triggered Responses for Safer, Longer-Lasting Li-Ion Batteries." International Battery Association Meeting, Cape Town, South Africa, April 12, 2011.
9. "Core-Shell Microcapsules for Damage Indication and Self-Healing." Michigan State University, Department of Chemistry, East Lansing, MI, January 24, 2011.
8. "Core-Shell Microcapsules in Self-Healing Materials." University of Kentucky, Department of Chemistry, Lexington, KY, January 14, 2011.
7. "Microcapsules and Mechanophores for Self-Healing Materials." University of Tennessee, Department of Chemistry, Knoxville, TN, January 3, 2011.
6. "Damage Indication and Self-Healing Using Core-Shell Microcapsules and Mechanophores." Dow-Corning Corporation, Midland, MI, December 14, 2010.
5. "Damage Indication and Self-Healing Using Core-Shell Microcapsules." Virginia Institute of Technology, Department of Chemistry, Blacksburg, VA, December 6, 2010.
4. "Putting Pi Bonds to Work in Organic Electronics." Carnegie Mellon University, Department of Chemistry, Pittsburgh, PA, November 22, 2010.
3. "Modulating Electron Transfer: From Small Molecules to Circuit Materials." Bowling Green State University, Department of Chemistry, Bowling Green, OH, November 3, 2010.
2. "Triggered Solutions for Longevity and Safety in Lithium Ion Batteries." University of Kentucky, Center for Applied Energy Research, Lexington, KY, May 21, 2010.
1. "Compartmentalized Solutions for Electronic Self-Healing." Beckman Institute Nanohour Seminar Series, University of Illinois, Urbana, IL, April 21, 2010.



## SOLICITED PRESENTATIONS

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27. "Robust Electron-Donating Organic Compounds for Non-Aqueous Redox Flow Batteries." 18th International Meeting on Lithium Batteries, Chicago, IL, June 21, 2016.
26. "Highly Soluble, Sometimes-Liquid Phenothiazines for Electrochemical Energy Storage Applications." 229th Meeting of the Electrochemical Society, San Diego, CA, June 1, 2016.
25. "Soluble, Stable One- and Two-Electron Donors for Electrochemical Energy Storage Applications." Gordon Research Conference on Batteries, Ventura Beach, CA, February 24, 2016.
24. "3,7-Bis(trifluoromethyl)-*N*-ethylphenothiazine: A Highly Soluble, Highly Stable Redox Shuttle and Electro-active Material for Non-Aqueous Redox Flow Batteries." 227th Meeting of the Electrochemical Society, Chicago, IL, May 27, 2015.
23. "A Roadmap to Designing Robust Redox Shuttles for Lithium-Ion Batteries." 227th Meeting of the Electrochemical Society, Chicago, IL, May 27, 2015.
22. "On the Stability and Reactivity of Phenothiazine-Based Redox Shuttles for Overcharge Protection." 227th Meeting of the Electrochemical Society, Chicago, IL, May 26, 2015.
21. "The Relationship of Radical Cation Stability and Overcharge Protection in Redox Shuttles for Lithium-Ion Batteries." International Battery Association 2014 Meeting, Brisbane, Australia, March 3, 2014.
20. "Controlling Glucose Release from Polymer Microcapsules." 245th National Meeting of the American Chemical Society, New Orleans, LA, April 11, 2013.
19. "Redox Shuttle Additives for High Voltage Lithium-Ion Battery Cathodes." 245<sup>th</sup> National Meeting of the American Chemical Society, New Orleans, LA, April 7, 2013.
18. "Self-Healing Electrical Circuits." Fall 2011 Materials Research Symposium, Boston, MA, December 2, 2011.
17. "Oxidizably Polymerizable Additives for the Stabilization of High Voltage Cathode Materials." International Battery Association Meeting, Cape Town, South Africa, April 12, 2011.
16. "Core-Shell Microcapsules for the Visual Indication of Mechanical Damage." Fall 2010 Materials Research Symposium, Boston, MA, November 30, 2010.
15. "Oxidizably Polymerizable Additives for Life Extension of High Voltage Cathode Materials in Lithium Ion Batteries." Argonne National Laboratory Postdoctoral Research Symposium, September 8, 2010.
14. "Electronic Restoration of Damaged Lithium Ion Batteries." 240th National Meeting of the American Chemical Society, Boston, MA, August 25, 2010.
13. "Fluorescence Resonance Energy Transfer as a New Tool for the Identification of Mechanically-Induced Chemical Reactions." 240<sup>th</sup> National Meeting of the American Chemical Society, Boston, MA, August 24, 2010.
12. "Putting Pi Bonds to Work in Organic Electronics." 240th National Meeting of the American Chemical Society, Boston, MA, August 23, 2010.
11. "Microcapsule Additives for Enhanced Performance of Lithium-Ion Batteries." 15th International Meeting on Lithium Batteries, Montreal, Canada, June 28, 2010.
10. "A Comparison of the Optical and Electronic Properties of Heteroatom-Substituted Bithiophene and Quaterthiophene Derivatives." 9<sup>th</sup> Functional Pi Electron Systems Meeting, Atlanta, GA, May 2010.
9. "Redox Shuttles and Encapsulated Additives for Overcharge Protection of Lithium Ion Batteries." 239<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, CA, March 2010.
8. "Core-Shell Microcapsules for Self-Healing Electronic Materials Systems." Fall 2009 Materials Research Symposium, Boston, MA, December 2009.
7. "Microencapsulated Precursors to Organic Charge Transfer Salts." Argonne National Laboratory Postdoctoral Research Symposium, September 10, 2009.
6. "Microencapsulation of Organic Donor and Acceptor Derivatives for the Potential Repair of Damaged Electronic Devices." Second International Conference on Self-Healing Materials, Chicago, IL, June 29, 2009.
5. "Spectroscopic Characterization of Bis(di(alkoxyphenyl)amine)s with Thiophene-based Bridges and Their Radical Cations." 234<sup>th</sup> National Meeting of the American Chemical Society, Boston, MA, August 19, 2007.

4. "Spectroscopic Characterization of Bis(di(alkoxyphenyl)amine)s with Thiophene-based Bridges and Their Radical Cations." International Symposium for Novel Aromatic Compounds, Awaji Island, Japan, July 2007.
3. "Microwave-enhanced Palladium-catalyzed Amination to Obtain Electron-rich Thiophene-based Materials." 231<sup>st</sup> American Chemical Society National Meeting, Atlanta, GA, March 29, 2006.
2. "New Acene Derivatives as Electroluminescent Materials." 55th Southeast Regional Meeting of the American Chemical Society, Atlanta, GA, November 2003.
1. "Tetracene Derivatives for Red Emission in OLEDs." 225th American Chemical Society National Meeting, New Orleans, LA, March 23, 2003.

## CURRENT AND PAST FUNDING (PI)

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NASA KY

01/01/16 – 12/31/16

### **Electron Transfer at Low Temperatures: Determining How Electronic Structure and Molecular Shape Affect Reaction Rates**

This proposal involves the development of new electro-active materials for non-aqueous redox flow batteries, specifically with an emphasis of materials that have high solubility in organic solvents that remain liquid at low temperatures for high-capacity batteries, for potential use in space applications.

Total Funding: \$30,000

NASA KY

01/01/16 – 12/31/16

### **Exploring Space with Non-Aqueous Redox Flow Batteries: Synthesis and Characterization of New Electrolytes**

This proposal involves the study of how the shape and electronic delocalization of the conjugated systems affects the rate of electron transfer at graphitic electrodes and the use of that information to identify materials candidates for low-temperature redox flow batteries.

Total Funding: \$15,000

ORNL

07/01/15 – 11/30/15

### **Oak Ridge Affiliated Universities Travel Grant**

This travel grant enabled funding for a postdoc and the PI to visit the Veith group at Oak Ridge National Laboratory to develop a protocol for the evaluation of electro-active materials as electron donors in non-aqueous redox flow batteries.

Total Funding: \$800

University of Kentucky College of Arts & Sciences

01/01/15 – 05/30/15

### **Density Functional Theory Investigations of the Stability and Reactivity of Organic Compounds in Energy-Storage Applications**

To gain a better understanding of the stability and reactivity of organic compounds for applications in lithium-ion batteries, both on a molecular level and through more complex modeling of interfaces.

Susan Odom and Chad Risko (equal PIs)

Total Funding: \$2,000

NSF CHE CSDM-B

07/01/13 – 06/30/17

### **Understanding the Stability and Reactivity of Radical Cations for Overcharge Protection in Lithium-Ion Batteries**

The overall goal of this proposal is to improve the stability of the radical cation forms of aromatic molecules used as redox shuttle electrolyte additives for overcharge protection in lithium-ion batteries.

Total Funding: \$413,000; 07/01/13 – 06/30/17

ACS PRF

01/01/12 – 08/31/14

**Robust Redox Shuttles for Overcharge Protection in Lithium-Ion Batteries**

This proposal involves the utilization of electrochemical and spectroscopic analysis of radical cations and their byproducts to design fatigue-resistant redox shuttles for safer batteries through enhanced overcharge protection.

Total Funding: \$100,000

NSF ACC Fellowship

09/01/09 – 08/31/11

**Microencapsulated Molecular Generators for Lithium-Ion Batteries**

The proposed research seeks to repair of damage to the electrodes and electrode-electrolyte interfaces through the autonomous incorporation of conductive polymers in cracked areas, and to prevent unsafe battery overcharging or overheating during cycling by the formation of a resistive polymer layer.

Total Funding: \$200,000

**CURRENT AND PAST FUNDING (CO-PI OR SENIOR PERSONNEL)**

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KY NSF EPSCoR EOC

09/01/16 – 06/30/16

**Expanding Your Horizons – a STEM Conference for Middle School Girls,” KY NSF EPSCoR, Education, Outreach, and Communication Mechanism**

This proposal seeks to fund a one-day conference for middle school girls in the Lexington that will feature a day of interactive STEM workshops for middle school-students led by UK undergraduate and graduate students and will also include college preparation sessions for accompanying parents.

Ellen V Crocker (PI), Susan A. Odom (co-PI), Bradford E. Condon (co-PI)

Total Funding: \$10,000

NSF MRI Program

07/01/16 – 06/30/17

**MRI: Acquisition of an X-ray Diffractometer for Materials Research**

This proposal seeks to replace an aging kappaCCD X-ray diffractometer with a modern instrument to support single-crystal analysis containing a modern micro-focus/multilayer optic focused source, to allow higher throughput and smaller samples, thereby increasing productivity.

Sean Parkin (PI), John Anthony (co-PI), Edith Glazer (co-PI), Susan Odom (co-PI)

Total Funding: \$383,133 (70% NSF, 30% UK match)

NSF EPSCoR

06/01/14 – 07/31/19

**Powering the Kentucky Bioeconomy for a Sustainable Future**

This proposal seeks to address commercial and technological challenges that impede the emergence of a robust economy based on the adoption of new technologies and sustainable practices in agriculture, energy, and the environment.

Rodney Andrews (PI), D.B. Battacharyya (co-PI), Y.T. Cheng (co-PI), Czarena Crofchek (co-PI), Seth DeBolt (co-PI), my role: proposal preparation and faculty participant in Pillar 3 (Electrochemical Energy Storage)

Total Funding: \$20M

Department for Energy Development and Independence

07/01/14 – 06/30/15

**Energy-Scavenging Thermogalvanic Cells for Improved Efficiency of Coal-Fired Power Plants and Post- Combustion Carbon Capture Systems via Waste Heat Utilization**

The project goal is to develop a small scale prototype that is critical in the development of a molten-salt-based energy-storage technology that is cost-effective and lowers the energy penalty of post-combustion CO<sub>2</sub> capture and sequestration for Kentucky’s coal-fired power generation fleet.

Cameron Lippert (PI), James-Landon (co-I), Susan Odom (co-PI)

Total Funding: \$94,000

Department for Energy Development and Independence

07/01/13 – 06/30/15

**Energy Research Grant Program for Efficient Improvement in CO<sub>2</sub> Capture Solvent Regeneration Using a Load Leveling Electricity to Thermal Energy Absorption Strategy**

The project addresses research to reduce cost and parasitic load in CO<sub>2</sub> capture or avoidance technologies and the levelized cost of electricity resulting from improved generation processes, fossil fuel combustion processes and/or CO<sub>2</sub> avoidance or capture processes.

Cameron Lippert (PI), James Landon (co-PI), Susan Odom (co-PI), Joe Remias (co-PI)

Total Funding: \$203,343

Grupo Antolin Ingeniería SA

02/01/12 – 01/13/13

**Exploration of the Applications of Graphene**

This project's goal involved the evaluation of graphite and graphite oxide materials as candidates for incorporation into polymer composites and as electrode materials for lithium-ion batteries.

Rodney Andrews (PI), John Anthony (co-PI), Mark Meier (co-PI), Susan Odom (co-PI), Matt Weisenberger (co-PI)

Total Funding: \$100,000

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**PLANNED FOR SUBMISSION IN THE NEAR TERM**

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NSF I-Corps Teams

10/01/16-03/31/17

**I-Corps: Electron-Donating Phenothiazines for Non-Aqueous Redox Flow Batteries**

In this project, we will further evaluate electron-donating materials developed in our laboratory for commercialization in various battery applications. Through attending workshops and conference calls, consultation with potential industrial partners, and conducting a market analysis, we will determine whether to form a start-up company and/or license our technology.

Susan Odom (PI), Aman Preet Kaur (Entrepreneurial Lead), James Landon (Mentor)

Total Award Amount: \$50,000 over 6 months

(note: invited to participate in Fall 2016 Cohort III)

NSF Partnerships for Innovation: Accelerating Innovation Research – Technology Translation

**PFI: AIR-TT: A Non-Aqueous Redox Flow Battery Prototype**

In this project, we will design, create, and cycle a non-aqueous redox flow battery prototype containing organic electro-active materials developed at the University of Kentucky.

Susan Odom (PI), John Anthony (co-PI), James Landon (co-PI)

Total Award Amount: \$200,000 over 18 months

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**TEACHING, INSTRUCTION, AND STUDENT DEVELOPMENT**

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**Academic Courses Taught as the Primary Instructor**

CHE 230 Organic Chemistry I

CHE 232 Organic Chemistry II

CHE 533 Qualitative Organic Analysis Laboratory

CHE 538 Principles of Organic Chemistry

CHE 776 Graduate Seminar (organic)

**Curriculum Development**

CHE 233 Organic Chemistry II Laboratory: developed an experiment with alginate-based capsules containing organic dyes to visualization of change in pH, or containing the enzyme lactase for production of lactose-free milk

CHE 533 Qualitative Organic Analysis Laboratory: redesigned 3 of 4 experiments to integrate a greater variety of spectroscopic techniques and the synthesis of organic compounds relevant to current research in organic electronics, energy storage, and the pharmaceutical industry

## **CURRENT AND FORMER GROUP MEMBERS**

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### **Postdoctoral Fellows (5)**

Matthew Casselman (2014–2016), Selin Ergun (2011–2014), Aman Preet Kaur (2013–present), Pramod Poudel (2013–2014), Rongbing Yang (2013)

### **Visiting Scholars Supervised (1)**

Subramanyam Modekrutti (2015–2016)

### **Graduate Students Supervised (6)**

Harsha Attanayake (2015-present), Nathaniel George (2015-present), John Jennings (2011–2012), Kishore Narayan (2011–2014), Edward Loya (2014–2016), Nicholas Wright (2015-2016)

### **Post-baccalaureate Students Supervised (4)**

Steven Chapman (2016), Nathaniel George (2015), Emma Holland (2016), Darius Allen Shariaty (2016)

### **Undergraduate Students Supervised (17)**

Bobby Barker (2012–2013), Rachael Burrows (2012–2013), Steven Chapman (2013–2016), Corrine Elliott (2013–present), Daniel Flores (2013–2015), Cortney Gandy (2012), Amanda Grass (2012), Bryan Ingoglia (2012–2014), Amir Kucharski (2013–2014), Stephen Manek (2012–2014), Anthony Marti (2012), Austin Miller (2013), Thuy Nguyen (2014-2015), Amita Patel (2013–2014), Darius Shariaty (2015–2016), Aleksandra Vidovich (2012), Peter Zhang (2015-present)

### **High School Students Supervised (7)**

Christine Brandewie (2014), Corrine Elliott (2011–2013), Henry Lin (2015), Nelson Ng (2012–2014), Michael Runipen (2013), Elizabeth Walsh (2011–2012), Naijiao Zhang (2013–2015)

### **Member on Graduate Student Committees (3)**

Mohaned Al-Shroofy (2015-present), Tao Chen (2015–present), Samuel Mazza (2016–present), Soledad Yao (2012–present)

## **PROFESSIONAL AFFILIATIONS**

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American Chemical Society (member, 2003–present)

Materials Research Society (member, 2009–present)

Kentucky Academy of Science (member, 2013–present)

Electrochemical Society (member, 2014–present)

## **SERVICE TO THE PROFESSION**

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### **Symposium Participation & Organization**

Materials Research Symposium, organizer of symposium EC1 (Fall 2016)

Gordon Conference on Batteries, discussion leader (2016)

### **Reviewing for Funding Agencies**

Department of Energy Vehicle Technologies Office, National Science and Engineering Council of Canada, National Science Foundation (Mathematical & Physical Sciences, Engineering), American Chemical Society Petroleum Research Fund

### **Reviewing for Journals**

ACS Applied Materials and Interfaces, Advanced Functional Materials, Applied Physics Letters, Current Opinion in Chemical Engineering, Chemistry – A European Journal, ChemSusChem, Electrochimica

Acta, Industrial and Engineering Chemistry Research, Journal of the American Chemical Society, Journal of the Electrochemical Society, Journal for Materials Chemistry A, Journal of Materials Chemistry C, Journal of Physical Chemistry, Journal of Polymer Science Part A: Polymer Science, Macromolecules, Nature, Nature Communications, Polymer, Progress in Polymer Science, Science of Advanced Materials

## UNIVERSITY SERVICE

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### Campus-Based Committees & Organization

Expanding Your Horizons, Organizing Committee, University of Kentucky (2016–present)  
Naff Symposium, Organizing Committee, University of Kentucky (2016–present)  
University Appeals Board, University of Kentucky (2014–present)  
Website Committee, Department of Chemistry, University of Kentucky (2014–present)  
Seminar Committee, Department of Chemistry, University of Kentucky (2015–present)  
Graduate Program Committee, Department of Chemistry, University of Kentucky (2014–2015)  
Society of Postdoctoral Scholars, University of Kentucky Chapter, Faculty Mentor (2014–present)  
Materials Research Society, University of Kentucky Chapter, Faculty Mentor (2014–present)  
Senator, University Senate, University of Kentucky (2013–2014)  
Academic Advising Committee, University Senate, University of Kentucky (2013–2014)  
Faculty Search Committee, Department of Chemistry, University of Kentucky (2013–2014)  
Graduate Recruitment Committee, Department of Chemistry, University of Kentucky (2012–2014)  
Undergraduate Program Committee, Department of Chemistry, University of Kentucky (2011–2012)  
University of Kentucky Regional Undergraduate Chemistry Poster Competition, organizer (2012)  
Society of Postdoctoral Scholars, University of Illinois chapter, co-founder, co-president (2009–2011)

### Mentorship in High School and College Science Programs

Honors Program Thesis Research Mentor (2014-2015, 2015-2016)  
Dunbar High School, Math, Science, and Technology Center, Mentor (2011–2015)  
Lexington Catholic High School, Exemplar Scholars Program, Mentor (2013)  
Chellgren Center for Undergraduate Excellence, Mentor (2013–2014)

### Workshop / Symposium Activities

Energy Storage Seminar Series, NSF EPSCoR Program, University of Kentucky, organizer (2015–2016)  
Summer Seminars for Science & Engineering faculty & students, University of Kentucky (Su2015)  
Three-Part Workshop on Preparing NSF Graduate Research Fellowship Applications (F2014)  
Dissertation Boot Camp, University of Kentucky, served on faculty panel (Su2014)  
Preparing Future Faculty Program, University of Kentucky, served on faculty panel (2012)  
University of Illinois Postdoctoral Research Symposium, co-organizer (2011)  
“Demystifying the Tenure Process: An Experimentalist’s Point of View,” An Overview and Panel, co-organizer, University of Illinois (2011)  
“Applying for Faculty Positions-Perspectives from Recent Hires,” An Overview and Panel, co-organizer and presenter, University of Illinois (2011)  
“Introduction to Science Education,” Faculty Panel on Grants for Science and Engineering Education, co-organizer, University of Illinois (2011)

## OUTREACH ACTIVITIES

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Molecular Gastronomy – a presentation and exercise involving the creation of edible polymer capsules

- Girls Do Science Club at Glendover Elementary School (S2015)
- UK’s STEMCats Program (F2014, F2016)
- Danville High School AP Chemistry students visiting the University of Kentucky (F2014)
- College of Arts & Sciences K Week at the University of Kentucky (F2013)

Science Fairs & Poster Competitions

- University of Kentucky’s First Annual Postdoctoral Research Symposium – judge (2015)

- Kentucky Science and Engineering Fair, Eastern Kentucky University – judge (2013)
- Central Kentucky Regional Science & Engineering Fair – judge (2013)
- Fayette County Public Schools District Science Fair – judge (2013)
- Undergraduate Regional Poster Competition Chemistry, University of Kentucky – judge (2012)
- Illinois Science Olympiad: designed and oversaw the State Chemistry Lab Competition (2009)

#### Collaborations in Art

- “Looking for Light: Chemistry, Art, Story, and Song” – event organized through the Math, Arts, and Science Coalition at the University of Kentucky that explored the idea of the interconnectedness between the arts and sciences through a mixed media performance. (presenter, 2015)

#### Self-Healing Polymer Demonstrations

- Beckman Institute Open House at University of Illinois: prepared self-healing polymer and circuit demonstrations (2011)
- Bahia Vista Elementary School: mailed 50 microcapsule “Pac man” samples for hands on demonstrations, communicated by videoconference with students to demonstrate sample handling and teach about self-healing polymers (2010)

#### Collaborations with Museums

- Chicago Museum of Science and Industry: prepared microcapsule-based self-healing samples for a display in Science Storms exhibit (2010)
- Orpheum Children’s Science Museum: designed and prepared experiments for Food Science and Forensic Science Summer day camps (2009)

#### Chemistry demonstrations

- Encouraging Tomorrow’s Chemists: prepared and volunteered for demonstrations in properties of matter, polymer science, and chemiluminescence at Urbana Middle School (2009-2010)
- Robeson Elementary School Science Night: volunteer in chemistry demonstrations for elementary children, approximately 400 attended (2009)

## **COLLABORATORS**

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John Anthony, University of Kentucky

Mitchell Anstey, Davidson College

Fikile Brushett, Massachusetts Institute of Technology

Y.T. Cheng, University of Kentucky

Chris Johnson, Argonne National Laboratory

Simon Jones, Jet Propulsion Laboratory

Bryant Polzin, Argonne National Laboratory

Chad Risko, University of Kentucky

Gabriel Veith, Oak Ridge National Laboratory

Tom Zawadonski, University of Tennessee